Art. VIII.—*Note on a Haemogregarine in the Blood of Varanus varius.*

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(With Plate VI.).

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Protozoa have been described as occurring in the blood of nearly all animals, generally associated with a diseased condition of the host (as Malaria and Sleeping Sickness in man, and Tick Fever in cattle), but not necessarily so, for the common rat is often found to harbour a trypanosome which seldom, if ever, produces any deleterious effects.

In many members of the Reptilia, especially the snakes, a falciform protozoan parasite has been discovered affecting the red cells of the blood. These parasites, in whatever species of cold-blooded vertebrate, are found to bear so close a resemblance to each other in general characteristics that, although by some considered to belong to one or other of three genera (Lankesterella, Karyolysus, and Haemogregarina), they are now usually placed in the one genus Haemogregarina of the family Haemogregarinidae of the group Sporozoa.

In Australia the presence of the genus Haemogregarina has been recorded in the blood of the Diamond Snake (*Python spilotes* Lacep), the Native Cat (*Dasyurus viverrinus* Shaw), in a Marsupial Squirrel (*Petaurus sciurus* Shaw), and in the Northern Carpet Snake (*Python amythestinus* Shaw), amongst native fauna, and also in the common rat (*Mus decumanus*) both in Sydney and Western Australia.[1] So far as I can find Haemogregarines have not been described in Australian lizards, though they have been elsewhere observed in species of Varanus, including one (*H. borreli*) from *Varanus griseus* described by

1 See Pro. Linn. Soc. N.S.W., 1909, p. 400 et seq. On some "Haemogregarines from Australian reptiles," by T. Harvey Johnston.

Nicolle and Comte[1] and one (*H. Varani*) from *V. niloticus* by Laveran.[2]

Recently while on a visit to the northern part of this State I had an opportunity of making post-mortem examinations on two "Goannas" (*Varanus varius*) immediately after they were shot, and some smears were made of the blood of each for subsequent examination. In the smears of one—that of a very young specimen—no parasites could be detected. But in those from the other—an animal in very fat condition, measuring about two feet from tip to tip, so not full grown—a number of red blood corpuscles were found to contain a parasite having all the characters of a Haemogregarine.

The blood smears before examination had been fixed in alcohol, and stained by Giemsa's double stain, and the following are the characters observed:—

The parasites are not numerous, in one slide only half-a-dozen intra-corpuscular bodies being detected. Some of the affected erythrocytes are distinctly larger than normal, though usually there is not any difference in size. The size of the affected red corpuscles varies from 14-17 microns long and from 8-11 microns wide, while the size of the unaffected ones rarely exceeds 14 microns long and 8 microns wide. The cell nucleus is frequently enlarged and generally eccentric, often lying close to the edge of the cell. The parasites themselves vary in size from slightly in excess of the length of the nucleus to a length exceeding that of the blood cell, when they may be seen distinctly curved inwards at either extremity. As a rule a concave border is presented towards the cell nucleus, but in one or two instances the convex border may be seen so disposed. The "capsule" is generally distinct, though in some cases indefinite. The nucleus of the parasite is almost invariably situated in the third nearest the broader, generally considered anterior, extremity. It sometimes appears as a kind of band, and in the majority of cases is sharply defined, but in one or two instances appears more or less diffuse. The cytoplasm is finely granular but often stains irregularly. The blood cell does not appear to

1 C. R. Soc. Biol., vol. lxi.

2 C. R. Soc. Biol., vol. lix.

be affected in any way beyond the increase in the size of the nucleus and the occasionally observed increased size of the cell.

In addition to the intra-corpuscular parasitic bodies a large number of free bodies, broader and shorter than the gregarines (8.4 to 9.8 microns long and 4.5 to 5.6 microns wide) may be seen in the smears. The great majority are slightly ovoid, but some are somewhat curved. Although staining fairly uniformly with the basic blue stain, a number show a double irregular rod-like body centrally situated, lying longitudinally. Similar bodies are not present in the smears from the other Varanus, so while it is possible these may be extra-corpuscular forms of the gregarine, at present one cannot be definite as to their nature.

As the literature referring to Haemogregarines in other Varanidae is at present inaccessible to me, I refrain from attaching any specific name to the parasite now recorded and described.

EXPLANATION OF PLATE VI.

1, 2, 3, 11, 13 show definite capsules.
2, showing apparently divided nucleus.
4, unaffected corpuscle.
7 and 8, extra-corpuscular bodies.
10, showing "banded" nucleus.